73rd MORSS CD Cover Page

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Advanced Precision Kill Weapon System (APKWS) Acceptable Risk:

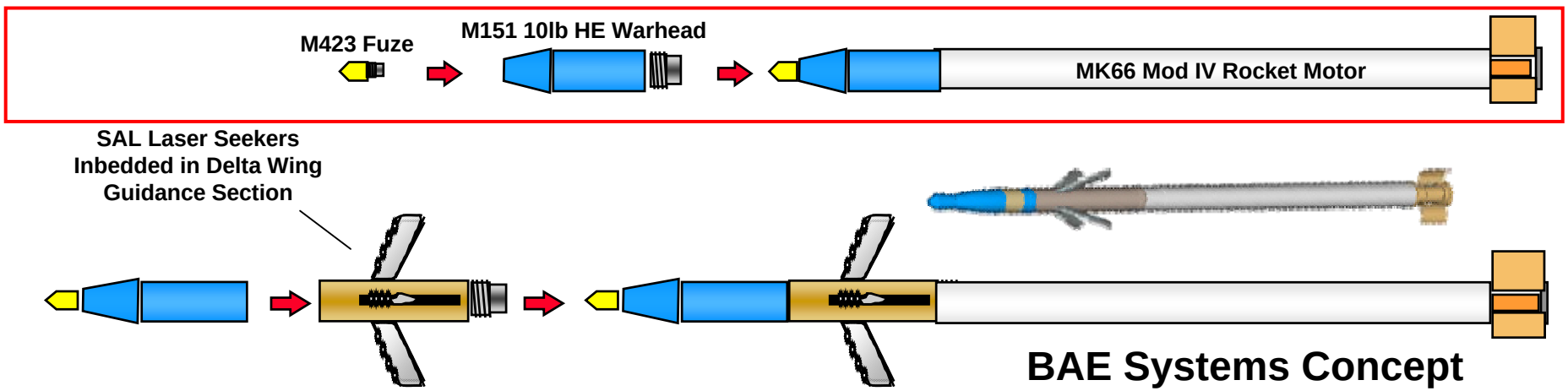
Experimental Pilots and Aircraft in Operational Testing

73rd MORS Symposium 22 JUN 05

Tried and True Hydra-70

APKWS

Hydra-70, 2.75-inch rocket system comprised of launchers, system management electronics (weapon control unit), upgraded fire control software, a MK66 rocket motor, laser detection and guidance section, and warhead.



Traditional Test Path

- **Test Schedule and Review Committee (TSARC) coordinates with US FORCES COMMAND (FORSCOM) upon review of requested operational unit test player composition and targeted test dates.**
- **FORSCOM reviews potential units for availability of requested test unit composition and then availability of unit during requested testing dates.**
- **Test location determined.**
- **Training conducted**
- **Test executed.**

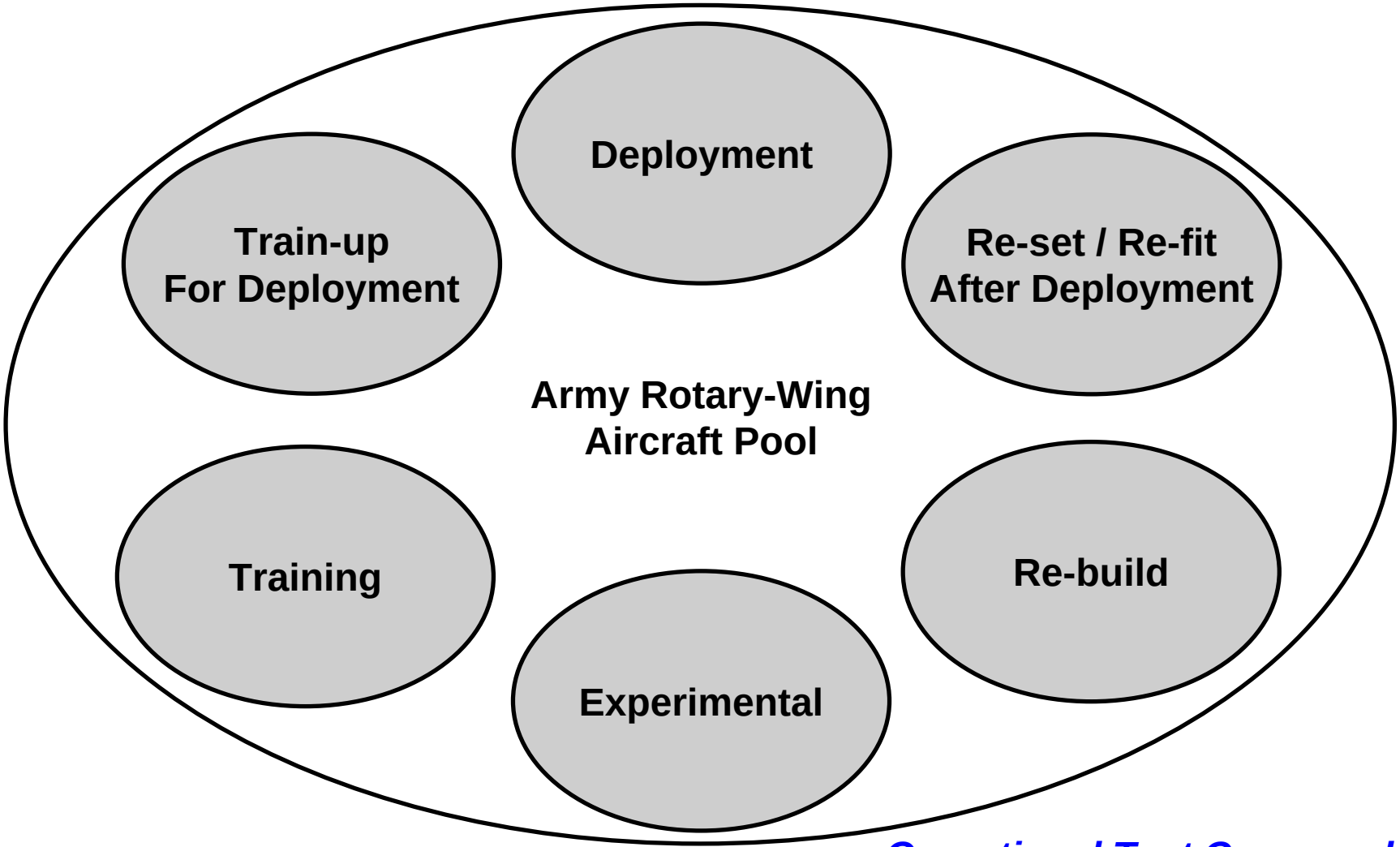
Why Did Different Choices have to be Considered?

- **Army Aircraft Usage.**
- **FORSCOM aviation unit operations tempo (OPTEMPO).**
- **Flexibility of unit to adapt to emerging development test results and test schedule changes (acceleration/slippage).**
- **Desire to have development test and a limited user test (operational test) back to back with only three working days between tests.**

Army Aircraft Usage is UP

- **Number of available aircraft for test has diminished over the last three years due to active theaters:**
  - **Korea**
  - **Afghanistan**
  - **Iraq**
- **Non-deployed aviation assets committed:**
  - **Training**
  - **Flying proficiency flights**
  - **Homeland security flights**
  - **VIP transport flights**
  - **Aircraft maintenance flights**
- **Aircraft out of circulation:**
  - **Aircraft upgrades**
  - **Aircraft Re-builds (forecasted and battle damage)**
  - **Transition of aircraft between elements for modularity**

Army Rotary-Wing Aircraft OPTEMPO



What is Considered Experimental Aircraft

- **For the Aviation Technical Test Center, an experimental aircraft is an aerial vehicle used for developmental flight testing and airworthiness qualification testing.**
- **Developmental flight testing of aircraft systems, subsystems, aircraft allied equipment and aviation life support equipment to influence the material acquisition decision making process.**
- **Airworthiness qualification testing focuses on assessing the handling qualities of the aerial vehicle and its performance (e.g., flight, hover, autorotation, etc) and flight in icing conditions.**

Experimental Aircraft

- **PROs:**
  - **Configured with on-board instrumentation.**
  - **Latest upgrades completed.**
  - **Robust maintenance data due to on-going reliability, availability, and maintenance (RAM) data collection.**

- **CONs:**
  - **No longer in an operationally fielded configuration.**
  - **Flight may be characteristics changed due to upgrades.**

Who are Experimental Pilots?

- **Graduates of the United States Naval Test Pilot School**
  - **48 week course.**
  - **Conducted twice a year.**

- **Fixed-wing, rotary-wing, and airborne systems curriculums provide instruction in academics, flight test preparation, flight test conduct, data collection, data reduction, and test report preparation**

Golden Crew

- **For an AH-64D a golden crew is two experimental pilots.**
- **PROs of a golden crew:**
  - **Are the “best of the best”.**
  - **Highly adaptive to schedule change.**
  - **Disciplined in creating and maintaining conditions for data collection.**
  - **Keen sense of situational awareness.**
- **CONs of a golden crew:**
  - **In quest of data collection, create highly structure scenarios not reflecting the operational environment.**
  - **Absence of mistakes made by new pilots**

Type III Error

Solving the wrong problem precisely is a type III error.

- **A type III can easily occur using experimental aircraft and pilots if two conditions are not managed:**
  - **The first condition is not using the same aircraft configuration as operational units.**
  - **Golden crews' skill and experience can prevent conditions from surfacing (key operational aspect) that new or lesser experienced pilots could encounter.**
- **Mitigation of these condition can be done by:**
  - **Returning experimental aircraft to operational configuration.**
  - **Mixed crews (experimental pilot and FORSCOM pilot).**

Conclusions

- **Experimental aircraft can be used once the aircraft are returned to a normally fielded configuration along with a certifying statement reflecting the configuration and noting any impact from leaving instrumentation in place.**

- **A mixed crew consisting of a FORSCOM pilot and an experimental pilot:**
  - **Capitalizes on data collection discipline.**
  - **Maintains newer (younger) pilot perspective.**
  - **Captures the broad spectrum of skills from new pilot to seasoned pilot.**

- **It is an acceptable risk to use experimental aircraft and pilots for a limited users operational test.**